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EPA Superfund
Record of Decision:

INDEPENDENT NAIL CO.
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BEAUFORT, SC
08/30/1988

CHROMIUM AND ZINC ARE METALS, CYANIDE IS AN INORGANIC ACID/CONJUGATE BASE. THE FOLLOWING IS A SUMMARY OF THESE CHARACTERISTICS FOR THE INDICATOR CONTAMINANTS SELECTED FOR THE SITE.

CHROMIUM

THE MOBILITY OF CHROMIUM IN THE ENVIRONMENT DEPENDS, TO A LARGE EXTENT, THE OXIDATIONS OF THE ELEMENT. CHROMIUM IS MOST COMMONLY FOUND IN THE +3 (CR III) AND +6 (CR VI) OXIDATION STATES. CR IV IS THOUGHT TO BE MORE MOBILE THROUGH THE ENVIRONMENT THAN CR III. THIS IS LIKELY BECAUSE CR III IS MORE READILY ADSORBED OR COMPLETED TO SOIL PARTICLES, METAL OXIDES, OR ORGANIC MATTER THAN IS CR VI, RENDERING IT RELATIVELY IMMOBILE. MOST OF THE CR LII FOUND IN SOILS IS IN THE FORM OF MIXED CR III AND FE III OXIDES OR IN THE LATTICE OF MINERALS. HOWEVER, CR III CAN BE MOBILIZED IN VERY ACIDIC MEDIA (KABATA-PENDIAS AND PENDIAS 1984). THE REDUCTION OF CR IV TO CR III, AND HENCE A DECREASE IN ITS MOBILITY, WAS OBSERVED BY BARTLETT AND KIMBLE (1976) ONLY IN SOILS CONTAINING ORGANIC MATTER, AND NOT IN A SOIL WHICH WAS CHARACTERIZED AS "ORGANIC FREE". SCHROEDER AND LEE (1975) FOUND THAT CR VI REDUCTION ALSO OCCURS IN THE PRESENCE OF FERROUS IRON (FE II), DISSOLVED SULFIDES, AND ORGANIC COMPOUNDS, ESPECIALLY THOSE WITH SULFHYDRYL GROUPS. CR III OXIDATION WAS FOUND TO OCCUR ONLY IN THE PRESENCE OF LARGE AMOUNTS OF MNO AND AT A VERY SLOW RATE BY ATMOSPHERIC OXYGEN. BOTH THE ELECTRIC POWER RESEARCH INSTITUTE (EPRI 1986), AND BARTLETT AND JAMES (1979) ALSO OBSERVED OXIDATION OF CR III TO CR VI IN SOILS WITH HIGH MNO2. THEIR RESULTS POINT TO AN OXIDATION-REDUCTION-REOXIDATION SCENARIO WITH A STEADY STATE OR EQUILIBRIUM BEING REACHED.

CYANIDE

THE MOBILITY OF CYANIDE IS INFLUENCED BY THE CATIONS WITH WHICH IT IS ASSOCIATED. THE MORE SOLUBLE SALTS, SUCH AS SODIUM OR POTASSIUM CYANIDE, WILL BE MORE MOBILE. COMPLEX ANIONS OF CYANIDE, SUCH AS FERROCYANIDE, CAN BE MOBILE IN SOILS (ALESII AND FULLER 1976). CYANIDE MOBILITY WAS FOUND TO BE PH DEPENDENT; LOW PH SOILS DECREASE THE MOBILITY OF CYANIDE. IN ADDITION, HIGHER IRON OXIDE AND CLAY CONTENT WERE ALSO FOUND TO DECREASE THE MOBILITY OF CYANIDE. IN GENERAL, THOUGH, CYANIDE WAS FOUND TO BE VERY MOBILE IN SOIL. ULTIMATELY, CYANIDE IN SOIL OR GROUNDWATER WILL BE BIODEGRADED. BOTH ANAEROBIC AND AEROBIC DEGRADATION OF CYANIDE HAS BEEN REPORTED WITH THE ULTIMATE BREAKDOWN PRODUCTS BEING CARBON DIOXIDE AND AMMONIA. THE RATE OF THE METABOLISM IS NOT KNOWN, BUT WOULD BE RELATED TO THE PRESENCE OF MICROORGANISMS CAPABLE OF METABOLIZING CYANIDE AS WELL AS THE CONCENTRATIONS OF CYANIDE IN THE SOIL OR GROUNDWATER.

ZINC

THE SOIL CHEMISTRY OF ZINC IS GOVERNED BY THE PH OF THE SOIL. IN ACIDIC SOILS, ZINC ADSORPTION IS RELATED TO CATION EXCHANGE SITES, WHILE IN ALKALINE SOILS THE CHEMISTRY IS DOMINATED BY ORGANIC LIGANDS. CATION EXCHANGE PROCESSES WILL BE INFLUENCED BY THE TYPE OF CATIONS MOVING THROUGH THE SOIL. THIS IMPLIES THAT WHEN THERE ARE MOBILE METALS, COMPETITION FOR THE BINDING SITES WILL OCCUR, AND ZINC MAY BE MOBILIZED. IN MORE ALKALINE SOILS ZINC CAN FORM AN ORGANO-ZINC COMPLEX, WHICH WOULD ALSO INCREASE THE METAL.S MOBILITY (KABATAS-PENDIAS-AND PENDIAS 1984).

METAL OXIDES ALSO INFLUENCE THE MOBILITY OF ZINC IN SOILS. ZINC WAS FOUND TO BE HIGHLY ASSOCIATED WITH OXIDES. CLAY IS ALSO CAPABLE OF SORBING ZINC. SOILS THAT CONTAIN HIGH LEVELS OF CALCIUM AND PHOSPHOROUS IMMOBILIZE THE METAL (KABATAS-PENDIAS AND PENDIAS 1984).

4.2 MECHANISMS OF MIGRATION

CONTAMINANTS DISSOLVED IN GROUNDWATER MAY MIGRATE BOTH HORIZONTALLY WITHIN AN AQUIFER AS WELL AS VERTICALLY BETWEEN AQUIFERS. AS HAS BEEN DISCUSSED IN THE RI REPORT, THE PERMEABILITY OF THE WATER TABLE AQUIFER IS HIGH, BUT HORIZONTAL MOVEMENT IS SLOW DUE TO THE LOW HYDRAULIC GRADIENT.

THIS IS EXEMPLIFIED BY THE FACT THAT IT IS ESTIMATED THAT THE PLUME OF THE CONTAMINATION IN THE WATER TABLE AQUIFER WOULD ONLY EXTEND 515 FEET FROM THE SOURCE AREAS IN THE DIRECTION OF FLOW. (THIS MODELING WAS PERFORMED USING A WORST-CASE SCENARIO AND ASSUMING THE GROUNDWATER CONTAMINATION ORIGINATED IN 1969). VERTICAL MOVEMENT OF GROUNDWATER IN THE WATER TABLE AQUIFER WOULD APPEAR TO BE SIGNIFICANT AS THE SITE IS LOCATED WITHIN AN AREA OF RECHARGE FOR THE FLORIDAN AQUIFER. A SEMI-CONFINING LAYER OF SANDY CLAY SEPARATES THE WATER TABLE AQUIFER FROM THE FLORIDAN AQUIFER. THIS LAYER IS REPORTEDLY NOT CONTINUOUS IN THE AREA OF THE SITE, SO DOWNWARD MIGRATION OF CONTAMINATION TO THE FLORIDAN AQUIFER FROM THE WATER TABLE AQUIFER IS POSSIBLE.

THE RESULTS FROM SAMPLING AT DIFFERENT DEPTHS WITHIN THE WATER TABLE AQUIFER INDICATE THAT CONTAMINANT LEVELS ARE VERY SIMILAR IN.THE SHALLOW, MEDIUM AND DEEP WELLS OF THIS AQUIFER. IN MOST CASES, THESE VALUES MAY REPRESENT NATURAL LEVELS SINCE, GENERALLY, LEVELS DETECTED WERE NEAR THE DETECTION LIMITS BELOW WHICH CONSTITUENTS WERE FOUND IN THE BACKGROUND WELL. ALTHOUGH, AS STATED ABOVE, THE POTENTIAL EXISTS FOR CONTAMINATION OF THE FLORIDAN AQUIFER FROM THE OVERLYING WATER TABLE AQUIFER, THIS IS NOT DEMONSTRATED BY THE EXISTING DATA.

BECAUSE REMEDIAL MEASURES HAVE ALREADY BEGUN AT THE INDEPENDENT NAIL COMPANY SITE, FURTHER INFILTRATION OF SOIL CONTAMINANTS TO THE GROUNDWATER IS NOT EXPECTED. THEREFORE, FOR ALL EXPOSURE PATHWAYS, THE MAXIMUM CONCENTRATIONS PRESENTLY FOUND IN THE GROUNDWATER WILL BE USED AS THE PLAUSIBLE MAXIMUM EXPOSURE CONCENTRATION. USE OF THESE MAXIMUM CONCENTRATIONS MAY OVER ESTIMATE RISK BECAUSE MOST CONCENTRATIONS DETECTED WERE MUCH LOWER. WELL DATA ARE AVAILABLE FOR 150 FEET TO THE SOUTH AND APPROXIMATELY 250 FEET SOUTHWEST OF THE OLD LAGOON (MW-1 AND MW-6 RESPECTIVELY). THEREFORE, THE DETECTED CONCENTRATIONS IN MW-1, 3, AND 6 WERE USED AS THE ASSUMED MAXIMUM CONCENTRATIONS IN THE GROUNDWATER.

4.3 HUMAN RISK CHARACTERIZATION

THE FOLLOWING PRESENTS A DISCUSSION OF THE POTENTIAL HUMAN HEALTH RISKS ASSOCIATED WITH THE CONTAMINANTS OF POTENTIAL CONCERN IN GROUNDWATER; CHROMIUM, CYANIDE AND ZINC AT THE INDEPENDENT NAIL COMPANY SITE.

4.3.1 TOXICITY CHARACTERIZATION

CHROMIUM

ALTHOUGH EPIDEMIOLOGICAL STUDIES OF WORKER POPULATIONS HAVE CLEARLY ESTABLISHED THAT CHROMIUM VI IS A HUMAN CARCINOGEN BY INHALATION EXPOSURE, CHROMIUM VI HAS NOT BEEN SHOWN TO BE CARCINOGENIC BY THE ORAL ROUTE (EPA 1984B). AN ORAL REFERENCE DOES (RFD) FOR CHROMIUM VI OF 5XLO MG/KG/DAY HAS BEEN ESTABLISHED (EPA 1988A). AN RFD IS AN ESTIMATE OF THE DAILY EXPOSURE TO THE HUMAN POPULATION (INCLUDING SENSITIVE SUBPOPULATIONS) THAT IS LIKELY TO BE WITHOUT APPRECIABLE RISK OF DELETERIOUS HEALTH EFFECTS DURING A LIFETIME.

CYANIDE

THE CARCINOGENICITY OF CYANIDE HAS NOT BEEN ESTABLISHED. EPA (1984D) HAS CLASSIFIED CYANIDE AS A GROUP D AGENT (I.E., NOT CLASSIFIED WITH RESPECT TO CARCINOGENICITY). THE ORAL REFERENCE DOSE (RFD) FOR FREE CYANIDE IS 0.02 MG/KG/DAY (EPA 1988A).

ZINC

WITH RESPECT TO CARCINOGENICITY, ZINC IS CATEGORIZED BY EPA (EPA 1984E) AS A GROUP D AGENT (I.E., NOT CLASSIFIED). AN ORAL REFERENCE DOSE (RFD) FOR ZINC OF 0.21 MG/KG/DAY HAS BEEN DERIVED BY EPA (1984E).

4.5 COMPARISON TO STANDARDS AND CRITERIA

GUIDANCE PROVIDED IN THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL (EPA 1986A) DIRECTS THAT CONCENTRATIONS OF CONTAMINANTS AT EXPOSURE POINTS BE COMPARED WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) THAT HAVE BEEN DEVELOPED TO PROTECT HUMAN HEALTH. EPA S INTERIM GUIDANCE ON ARARS (EPA 1987B) DEFINES ARARS AS FOLLOWS:

> APPLICABLE REQUIREMENTS INCLUDES THOSE CLEANUP STANDARDS, STANDARDS OF CONTROL, AND OTHER SUBSTANTIVE ENVIRONMENTAL PROTECTION REQUIREMENTS, CRITERIA, OR LIMITATIONS PROMULGATED UNDER FEDERAL OR STATE LAW THAT SPECIFICALLY ADDRESS A HAZARDOUS SUBSTANCE, POLLUTANT, CONTAMINANT, REMEDIAL ACTION, LOCATION, OR OTHER CIRCUMSTANCES AT A CERCLA SITE.
>
> "APPLICABILITY" IMPLIES THAT THE REMEDIAL ACTION OR THE CIRCUMSTANCES AT THE SITE SATISFY ALL OF THE JURISDICTIONAL PREREQUISITES OF A REQUIREMENT...
>
> RELEVANT AND APPROPRIATE REQUIREMENTS INCLUDE THOSE CLEANUP STANDARDS, STANDARDS OF CONTROL, AND OTHER SUBSTANTIVE ENVIRONMENTAL PROTECTION REQUIREMENTS, CRITERIA, OR LIMITATIONS PROMULGATED UNDER FEDERAL OR STATE LAW THAT, WHILE NOT "APPLICABLE" TO A HAZARDOUS SUBSTANCE, POLLUTANT, CONTAMINANTS, REMEDIAL ACTION, LOCATION, OR OTHER CIRCUMSTANCE AT A CERCLA SITE, ADDRESS PROBLEMS OR SITUATIONS SUFFICIENTLY SIMILAR TO THOSE ENCOUNTERED AT THE CERCLA SITE THAT THEIR USE IS WELL SUITED TO THE PARTICULAR SITE.

FOR WATER THAT IS OR MAY BE USED FOR DRINKING, THE MAXIMUM CONTAMINANT LEVELS UNDER THE SAFE DRINKING WATER ACT ARE GENERALLY THE APPLICABLE OR RELEVANT AND APPROPRIATE STANDARD. AT THE INDEPENDENT NAIL COMPANY SITE, WHERE THE GROUNDWATER IS A POTENTIAL SOURCE OF DRINKING WATER, MAXIMUM CONTAMINANT LEVELS (MCLS), ARE THE RELEVANT AND APPROPRIATE REQUIREMENTS FOR GROUNDWATER. MCLS ARE CONCENTRATION STANDARDS WHICH ARE ENFORCEABLE BY LAW, HEALTH ADVISORIES AND SECONDARY MCLS ARE NONENFORCEABLE HEALTH-BASED GOALS AND GUIDELINES, RESPECTIVELY.

PRIMARY AND SECONDARY MAXIMUM CONTAMINANT LIMITS (MCLS AND SMCLS). PRIMARY MCLS ARE FEDERAL DRINKING WATER STANDARDS PROMULGATED UNDER THE SAFE DRINKING WATER ACT (SDWA). GENERALLY, A MCL FOR A TOXIC CHEMICAL REPRESENTS THE ALLOWABLE LIFETIME EXPOSURE TO THE CONTAMINANT FOR A 70-KG ADULT WHO IS ASSUMED TO INGEST TWO LITERS OF WATER PER DAY. IN ADDITION TO HEALTH FACTORS, A MCL IS REQUIRED BY LAW TO REFLECT THE TECHNOLOGICAL AND ECONOMIC FEASIBILITY OF REMOVING THE CONTAMINANT FROM THE WATER SUPPLY. THE LIMIT SET MUST BE FEASIBLE GIVEN THE BEST AVAILABLE TECHNOLOGY AND TREATMENT TECHNIQUES (EPA 1986A). SECONDARY DRINKING WATER REGULATIONS CONSIST PRIMARILY OF SECONDARY MAXIMUM CONTAMINANT LEVELS (SMCLS) CONTAMINANTS THAT PRIMARILY AFFECT THE AESTHETIC QUALITIES (SUCH AS TASTE AND ODOR) OF DRINKING WATER. SECONDARY MCLS ARE NOT FEDERALLY ENFORCEABLE STANDARDS, THEY ARE INTENDED AS GUIDELINES FOR USE BY STATES IN REGULATING WATER SUPPLIES.

THE STATE OF SOUTH CAROLINA HAS PROMULGATED DRINKING WATER STANDARDS (MCLS) BY ADOPTING THE FEDERAL MCLS DEVELOPED UNDER SDWA. ACCORDING TO EPA GUIDANCE ON THE USE OF MCLS AS ARARS (EPA 1987B), MCLS ARE APPLICABLE AT THE TAP WHERE THE WATER WILL BA PROVIDED DIRECTLY TO 25 OR MORE PEOPLE OR WILL BE SUPPLIED TO 15 OR MORE SERVICE CONNECTIONS, BUT IN ADDITION ARE RELEVANT AND APPROPRIATE REQUIREMENTS AGAINST WHICH TO EVALUATE GROUNDWATER QUALITY.

DRINKING WATER HEALTH ADVISORIES. IN ADDITION TO MCLS AND MCLGS, EPA PROVIDES DRINKING WATER SUPPLIERS WITH GUIDANCE ON VARIOUS CHEMICALS THAT MAY BE ENCOUNTERED IN A WATER SYSTEM. THE OFFICE OF DRINKING WATER.S NONREGULATORY HEALTH ADVISORIES ARE CONCENTRATIONS OF CONTAMINANTS IN DRINKING WATER AT WHICH ADVERSE EFFECTS WOULD NOT BE ANTICIPATED TO OCCUR. A MARGIN OF SAFETY IS INCLUDED TO PROTECT SENSITIVE MEMBERS OF THE POPULATION. THE HEALTH ADVISORY NUMBERS ARE

DEVELOPED FROM DATA DESCRIBING NONCARCINOGENIC AND END POINTS OF TOXICITY. THEY DO NOT INCORPORATE QUANTITATIVELY ANY POTENTIAL CARCINOGENIC RISKS FROM SUCH EXPOSURE. HEALTH ADVISORIES ARE FURTHER DESCRIBED IN EPA (1986A), WHICH STATES THAT "UNDER CERTAIN CIRCUMSTANCES AND WHEN THE APPROPRIATE TOXICOLOGICAL DATA ARE AVAILABLE, HEALTH ADVISORIES MAY BE DEVELOPED FOR ONE-DAY, TEN-DAY, LONGER-TERM (SEVERAL MONTHS TO SEVERAL YEARS), AND LIFETIME DURATIONS OF EXPOSURE. ONE-DAY AND TEN-DAY ADVISORIES ARE CALCULATED FOR A 10 KG CHILD (A ONE-YEAR OLD INFANT) ASSUMED TO DRINK ONE LITER OF WATER PER DAY. LIFETIME HEALTH ADVISORIES ARE CALCULATED FOR A 70 KG ADULT, ASSUMED TO DRINK TWO LITERS OF WATER PER DAY. LONGER TERM HEALTH ADVISORIES ARE CALCULATED FOR BOTH A 10 KG CHILD AND A 70 KG ADULT."

CHROMIUM, CYANIDE, AND ZINC HAVE BEEN DETECTED IN GROUNDWATER AT THE INDEPENDENT NAIL COMPANY SITE AT MAXIMUM CONCENTRATIONS OF 0.058 MG/LITER, 0.110 MG/LITER AND U.098 MG/LITER, RESPECTIVELY. A COMPARISON OF THESE CONTAMINANT CONCENTRATIONS WITH DRINKING WATER MCLS, SMCLS, AND HEALTH ADVISORIES INDICATES THAT TOTAL CHROMIUM IS THE ONLY GROUNDWATER CONTAMINANT AT THE INDEPENDENT NAIL COMPANY SITE WHICH EXCEEDS ANY OF THESE STANDARDS OR CRITERIA.

THE MCL FOR TOTAL CHROMIUM IN DRINKING WATER ARE 0.05 MG/LITER AND 0.12 MG/LITER, RESPECTIVELY (EPA 1985E). THE 1-DAY, 10-DAY AND LIFETIME DRINKING WATER HEALTH ADVISORIES FOR CHROMIUM ARE 1.4 MG/LITER, 1.4 MG/LITER, AND 0.12 MG/LITER, RESPECTIVELY (EPA 1987A). THE LONGER TERM DRINKING WATER HEALTH ADVISORY FOR CHROMIUM FOR A 70 KG ADULT AND A 10 KG CHILD ARE 0.84 MG/LITER AND 0.24 MG/LITER, RESPECTIVELY (EPA 1987A). THUS, THE HIGHEST TOTAL CHROMIUM CONCENTRATION DETECTED IN GROUNDWATER AT THE INDEPENDENT NAIL COMPANY SITE (0.058 MG/LITER) SLIGHTLY EXCEEDS THE CURRENT FEDERAL AND STATE MCL (0.05 MG/LITER), BUT IS LOWER THAN THE PROPOSED SMCL (0.12 MG/LITER). IT SHOULD BE NOTED THAT THE PROPOSED SECONDARY MCL IS MORE THAN TWICE THE HIGHEST CONCENTRATION DETECTED AT THE SITE.

NO MCLS HAVE BEEN ESTABLISHED FOR CYANIDE; HOWEVER, DRINKING WATER HEALTH ADVISORIES HAVE BEEN DERIVED (EPA 1987A). THE 1-DAY, 10-DAY, AND LIFETIME HEALTH ADVISORIES FOR CYANIDE ARE 0.22 MG/LITER, 0.22 MG/LITER, AND 0.154 MG/LITER, RESPECTIVELY. THE LONGER TERM HEALTH ADVISORY FOR CYANIDE FOR A 70 KG ADULT AND 10 KG CHILD ARE 0.77 MG/LITER AND 0.22 MG/LITER, RESPECTIVELY (EPA 1987A). THUS, THE HIGHEST CONCENTRATION OF CYANIDE DETECTED AT THE INDEPENDENT NAIL COMPANY SITE (0.110 MG/LITER) IS BELOW EACH OF THESE HEALTH ADVISORY CRITERIA.

A SECONDARY MCL OF 5 MG/LITER HAS BEEN ESTABLISHED FOR ZINC BASED ON ORGANOLEPTIC (TASTE/ODOR) CONSIDERATIONS (EPA 1986E). THE HIGHEST CONCENTRATION OF ZINC DETECTED IN GROUNDWATER AT THE INDEPENDENT NAIL COMPANY SITE (0.098 MG/LITER) IS WELL BELOW THE SECONDARY MCL. NO PRIMARY MCLS, OR DRINKING WATER HEALTH ADVISORIES FOR ZINC HAVE BEEN ESTABLISHED.

TABLE 4-1 PRESENTS A COMPARISON OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER AND VARIOUS DRINKING WATER STANDARDS AND CRITERIA.

4.6 ESTIMATION OF EXPOSURE AND RISK

ESTIMATES OF HUMAN EXPOSURE TO CONTAMINANTS AT THE INDEPENDENT NAIL COMPANY SITE WILL BE DETERMINED USING CONSERVATIVE ASSUMPTIONS. CONSERVATIVE ASSUMPTIONS TEND TO OVERESTIMATE EXPOSURE SO THAT THE UPPER END OF THE RANGE OF ACTUAL EXPOSURES. HUMAN EXPOSURE CAN BE EXPRESSED IN TERMS OF A CHRONIC DAILY INTAKE (CDI), WHICH IS THE AMOUNT OF A SUBSTANCE TAKEN INTO THE BODY PER UNIT WEIGHT PER UNIT OF TIME, OR MG/KG/DAY. FOR NONCARCINOGENS, THE CDI IS DETERMINED BY AVERAGING INTAKE OVER THE PERIOD OF EXPOSURE.

IN EVALUATING HEALTH RISKS FROM EXPOSURE TO NONCARCINOGENS (THE CATEGORY INTO WHICH THE THREE CHEMICALS OF POTENTIAL CONCERN AT THE SITE FALL), RISK REFERENCE DOSES (RFDS) WILL BE USED. THE RFD, EXPRESSED IN UNITS OF MG/KG/DAY, IS AN ESTIMATE OF THE DAILY EXPOSURE TO THE HUMAN POPULATION (INCLUDING SENSITIVE SUBPOPULATIONS) THAT IS LIKELY TO BE WITHOUT AN APPRECIABLE

RISK OF DELETERIOUS EFFECTS DURING A LIFETIME. RFDS ARE TYPICALLY DERIVED EITHER FROM HUMAN STUDIES INVOLVING WORK PLACE EXPOSURES OR FROM EXPERIMENTAL ANIMAL STUDIES.

POTENTIAL RISKS FOR NONCARCINOGENS ARE PRESENTED AS THE RATIO OF THE CHRONIC DAILY INTAKE EXPOSURE TO THE RISK REFERENCE DOSE (CDL:RFD). THIS IS A USEFUL REFERENCE POINT FOR GAUGING THE POTENTIAL ADVERSE NONCARCINOGENIC HEALTH EFFECTS THAT COULD POTENTIALLY OCCUR. A HAZARD INDEX LESS THAN 1 INDICATES THAT AN ADVERSE NONCARCINOGENIC HEALTH EFFECT IS UNLIKELY TO OCCUR. A CLEAR CONCLUSION SHOULD NOT BE CATEGORICALLY MADE, HOWEVER, THAT ALL HAZARD INDEXES LESS THAN ONE ARE ACCEPTABLE AND THAT ALL HAZARD INDICES GREATER THAN ONE ARE UNACCEPTABLE. THIS IS A CONSEQUENCE OF THE PERHAPS ONE ORDER OF MAGNITUDE OR GREATER UNCERTAINTY INHERENT IN ESTIMATES OF THE RFD AND CDI.

4.7 SUMMARY AND CONCLUSIONS

HUMAN EXPOSURES AND RISKS

POTENTIAL HUMAN HEALTH IMPACTS ASSOCIATED WITH THE CHEMICALS OF POTENTIAL CONCERN IN THE GROUNDWATER AT THE SITE WERE ASSESSED BY (1) COMPARISON OF THE MAXIMUM DETECTED CHEMICAL CONCENTRATIONS TO STANDARDS {APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)} OR OTHER CRITERIA DEVELOPED FOR THE PROTECTION OF HUMAN HEALTH, AND (2) DEVELOPMENT OF EXPOSURE ASSOCIATED WITH VARIOUS GROUNDWATER USES AND TO DERIVE QUANTITATIVE ESTIMATES OF ASSOCIATED RISKS.

THE MAXIMUM GROUNDWATER CONCENTRATIONS OF THE CHEMICALS OF POTENTIAL CONCERN WERE COMPARED TO ARARS OR OTHER GUIDANCE - FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLS), SECONDARY MAXIMUM CONTAMINANT LEVELS (SMCLS), AND DRINKING WATER HEALTH ADVISORIES. THIS COMPARISON REVEALED THAT THE HIGHEST CHROMIUM CONCENTRATION DETECTED IN GROUNDWATER (0.058 MG/LITER) SLIGHTLY EXCEEDED THE MCL OF 0.05 MG/LITER FOR TOTAL CHROMIUM HOWEVER, ALL OTHER CONTAMINANT CONCENTRATIONS WERE BELOW CURRENTLY AVAILABLE MCL, SMCL, AND/OR HEALTH ADVISORY DRINKING WATER STANDARDS.

FOR THE QUANTITATIVE ASSESSMENT OF RISK, THREE POTENTIAL EXPOSURE PATHWAYS WERE IDENTIFIED WAS THE INDEPENDENT NAIL COMPANY SITE:

- INGESTION OF GROUNDWATER
- INGESTION OF MILK;
- INGESTION OF BEEF.

THE CHEMICALS OF POTENTIAL CONCERN ARE EACH NONCARCINOGENS WHEN INGESTED, AND THEREFORE, POTENTIAL HEALTH RISKS ASSOCIATED WITH EACH CHEMICAL FOR EACH OF THE ABOVE EXPOSURES WERE EXPRESSED AS THE RATIO OF THE CHRONIC DAILY INTAKE TO THE REFERENCE DOSE (CDI:RFD). THE CDI:RFD RATIOS FOR EACH CHEMICAL WITHIN A GIVEN PATHWAY WERE SUMMED TO DERIVE THE HAZARD INDEX. TABLE 4-2 PRESENTS A SUMMARY OF THE CDIS AND ORAL RFDS USED IF THE PRESENT ANALYSIS FOR EVALUATING THE POTENTIAL HEALTH RISKS OF EACH CONTAMINANTS. ALSO INCLUDED IN TABLE 4-2 IS A SUMMARY OF THE HAZARD INDICES ASSOCIATED WITH CHEMICALS OF POTENTIAL CONCERN FOR EACH OF THE THREE EXPOSURE PATHWAYS EVALUATED. THE HAZARD INDEX FOR EACH PATHWAY WAS LESS THAN ONE, INDICATING THERE IS A LOW POTENTIAL FOR ADVERSE NONCARCINOGENIC HEALTH EFFECTS FROM INGESTION OF GROUNDWATER, MILK, AND/OR BEEF AT THE INDEPENDENT NAIL COMPANY SITE.

WILDLIFE EXPOSURES AND RISKS

RISKS TO AQUATIC-AND TERRESTRIAL SPECIES POTENTIALLY EXPOSED TO CHROMIUM, CYANIDE, AND ZINC ALSO WERE ASSESSED. SINCE NO WATER QUALITY DATA IS AVAILABLE FROM SURFACE WATER, POTENTIAL EXPOSURES TO AQUATIC LIFE WERE ASSESSED ASSUMING THAT GROUNDWATER CHEMICALS OF POTENTIAL CONCERN MAY DISCHARGE INTO SALT CREEK AND ITS ASSOCIATED WETLANDS AT CONCENTRATIONS EQUAL TO THE MAXIMUM

CONCENTRATIONS DETECTED IN GROUNDWATER. RISKS WERE ESTIMATED BY COMPARING THESE GROUNDWATER CONCENTRATIONS TO THE AMBIENT WATER QUALITY CRITERIA FOR EACH CHEMICAL. POTENTIAL EXPOSURES FOR TERRESTRIAL SPECIES WERE ASSESSED ASSUMING THAT COWS OR OTHER WILDLIFE USE CONTAMINATED GROUNDWATER AS A SOLE SOURCE OF DRINKING WATER AND INGEST AN AMOUNT OF WATER DAILY THAT IS EASILY EQUIVALENT TO 20 PERCENT OF THEIR BODY WEIGHT THE MAXIMUM CONCENTRATIONS OF THE CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER WERE AGAIN USED AS EXPOSURE CONCENTRATIONS. RISKS WERE DETERMINED BY COMPARING THE ESTIMATED CHEMICAL INTAKES OR THE WATER CONCENTRATION TO TOXIC LEVELS OR NOT EFFECT LEVELS IDENTIFIED FROM THE LITERATURE.

MAXIMUM CONCENTRATIONS OF CHROMIUM AND CYANIDE IN GROUNDWATER EACH EXCEEDED ITS ACUTE AND CHRONIC AMBIENT (SURFACE) WATER QUALITY CRITERIA, WHEREAS CONCENTRATIONS OF ZINC IN GROUNDWATER WERE BELOW ITS CRITERIA HOWEVER, IT IS NOT BELIEVED THAT ANY OF THE CHEMICALS OF POTENTIAL CONCERN AT THE CONCENTRATIONS DETECTED IN THE GROUNDWATER IN THE MONITORING WELLS AT THE INDEPENDENT NAIL COMPANY SITE WILL REACH SALT CREEK OR SURROUNDING WETLANDS IN CONCENTRATIONS ASSOCIATED WITH TOXIC EFFECTS IN AQUATIC LIFE DUE TO DISPERSION AND DILUTION OF CONCENTRATIONS WITHIN GROUNDWATER AND SURFACE WATER.

TERRESTRIAL WILDLIFE SPECIES DO NOT APPEAR TO BE AT ANY INCREASED HEALTH RISKS FROM THE INGESTION OF CHROMIUM, CYANIDE AND ZINC AT THE MAXIMUM CONCENTRATIONS DETECTED IN GROUNDWATER AT THE SITE AS THE WATER CONCENTRATIONS OR ESTIMATED INTAKE LEVELS ARE WELL BELOW THOSE LEVELS BELIEVED TO BE ASSOCIATED WITH TOXIC EFFECTS.

#EAN

5.0 ENFORCEMENT ANALYSIS

THE INDEPENDENT NAIL COMPANY SITE WAS ADDED TO THE NPL IN SEPTEMBER 1984, AND EPA ASSUMED LEAD RESPONSIBILITY FOR THE SITE AT THAT TIME. DUE TO THE NATURE OF CONTAMINATION AT THE SITE AND ITS WELL-DOCUMENTED HISTORY, THE BLAKE AND JOHNSON COMPANY AND THE INDEPENDENT NAIL COMPANY ARE THE TWO IDENTIFIED POTENTIALLY RESPONSIBLE PARTIES. A NOTICE LETTER WAS SENT TO THE INDEPENDENT NAIL COMPANY IN JUNE 1985. SINCE THEY DECLINED TO PARTICIPATE, EPA PROCEEDED TO CONDUCT THE RI/FS. THE RI/FS COMMENCED IN JUNE 1985.

#CRH

6.0 COMMUNITY RELATIONS HISTORY

THE FOLLOWING COMMUNITY RELATIONS ACTIVITIES WERE PERFORMED AT THE INDEPENDENT NAIL COMPANY SITE:

- A FACT SHEET ON THE SITE WAS PREPARED IN NOVEMBER 1986.
- COMMUNITY RELATIONS PLAN FINALIZED JANUARY 1987
- AN INFORMATION REPOSITORY WAS ESTABLISHED IN JANUARY AT:

  BEAUFORT COUNTY LIBRARY (803) 525-7279
  710 CRAVEN STREET
  BEAUFORT, SOUTH CAROLINA 29902

  CONTACT: MS. JULIE ZACHOWSKI, LIBRARIAN

- A PRESS RELEASE PROVIDING AN OPPORTUNITY FOR A PUBLIC MEETING AND INFORMATION ON THE OPENING OF THE PUBLIC COMMENT PERIOD WAS ISSUED JULY 21, 1987.
- PUBLIC NOTICES PROVIDING THE SAME INFORMATION RAN IN THE JULY 23 AND JULY 24, 1987

EDITIONS OF THE BEAUFORT GAZETTE, A DAILY PAPER DETERMINED TO BE THE MOST WIDELY READ IN THE AREA.

- A PUBLIC NOTICE AS TO THE AVAILABILITY OF THE OPERABLE UNIT ONE ROD AND THE REMEDIAL DESIGN FOR OPERABLE UNIT ONE RAN IN MAY 1988 IN THE BEAUFORT GAZETTE.

- A PUBLIC NOTICE AS TO THE AVAILABILITY OF THE DRAFT OPERABLE UNIT TWO RI REPORT AND THE PROPOSED PLAN WAS RUN ON JUNE 30, 1988. THIS NOTICE ALSO PROVIDED THE PUBLIC WITH AN OPPORTUNITY FOR A PUBLIC MEETING AND NOTIFICATION OF THE OPENING OF THE PUBLIC COMMENT PERIOD. THIS PUBLIC NOTICE RAN IN THE BEAUFORT GAZETTE.

- A PRESS RELEASE PROVIDING THE SAME INFORMATION AS THE JUNE 30 PUBLIC NOTICE WAS ALSO PREPARED.

NO OPPOSITION TO THE RECOMMENDED ACTION IS ANTICIPATED.

#STN

7.0 STATE INVOLVEMENT

THE STATE OF SOUTH CAROLINA HAS BEEN ACTIVELY INVOLVED WITH THE INDEPENDENT NAIL COMPANY SITE SINCE IT WAS FIRST DISCOVERED.

THEY HAVE BEEN A PART OF OFFICIAL DOCUMENT REVIEWS AND HAVE CONCURRED WITH ACTIVITIES AT THE SITE TO DATE.

#SRA

8.0 SELECTED REMEDIAL ALTERNATIVE

FROM AN ANALYSIS OF ALL AVAILABLE AND PERTINENT INFORMATION REGARDING THE INDEPENDENT NAIL COMPANY SITE, IT IS CONCLUDED THAT ADDITIONAL REMEDIAL ACTIONS ARE NOT NECESSARY FOR THE PROTECTION OF HUMAN HEALTH OR THE ENVIRONMENT. THEREFORE THE SELECTED REMEDIAL ALTERNATIVE AT THE SITE IS NO ACTION.

IT IS BELIEVED THAT THE SOURCE CONTROL REMEDIAL ACTION CONDUCTED MARCH 28 - MAY 27, 1988 AT THE SITE HAD LITTLE OR NO IMPACT ON GROUNDWATER QUALITY IN THE AREA OF THE SITE. AFTER A FINAL ROUND OF SAMPLING TO CONFIRM THIS, A DECISION AS TO WHETHER MONITORING OF THE WELLS AT THE SITE SHOULD BE CONTINUED OR THE WELLS ABANDONED WILL BE MADE.

COST OF RECOMMENDED REMEDIAL ACTION

THIS REMEDIAL ACTION HAS NO COSTS ASSOCIATED WITH IT.

THE REMAINING SAMPLING AND WELL ABANDONMENT COSTS HAVE BEEN INCLUDED AS PART OF THE OPERABLE UNIT ONE REMEDIAL ACTION COSTS.

#SD

THE STATUTORY DETERMINATIONS

- PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

  THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, AS CONDITIONS AT THE SITE WERE SHOWN IN THE RISK ASSESSMENT TO POSE NO THREAT.

  NO UNACCEPTABLE SHORT-TERM RISKS OR CROSS-MEDIA IMPACTS WILL BE CAUSED BY THIS REMEDY.

- ATTAINMENT OF ARARS
  THE SELECTED REMEDY WILL ATTAIN ALL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS.

THE FOLLOWING WERE IDENTIFIED AS THE FEDERAL AND STATE ARARS FOR THIS SITE:

- OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) NO HEALTH AND SAFETY PLAN WILL BE NECESSARY.

- SAFE DRINKING WATER ACT (SDWA)
  THE MAXIMUM CONCENTRATION OF CHROMIUM DETECTED IN A WELL ON-SITE WAS 58 PPB. THIS IS ABOVE THE MCL FOR CHROMIUM (50 UG/1), BUT LESS THAN HALF OF THE MCLG. ALL OTHER WELLS HAD CHROMIUM CONCENTRATIONS LESS THAN THE MCL.

- ENDANGERED SPECIES ACT
  THE RECOMMENDED REMEDIAL ALTERNATIVE IS PROTECTIVE OF SPECIES LISTED AS ENDANGERED OR THREATENED UNDER THE ENDANGERED SPECIES ACT.

- STATE DRINKING WATER STANDARDS
  MAXIMUM CONTAMINANT LEVELS ESTABLISHED BY THE STATE OF SOUTH CAROLINA REGULATIONS ARE ADOPTED FROM THOSE OF THE FEDERAL SAFE DRINKING WATER ACT, AND HAVE BEEN ADDRESSED IN THIS ROD.

- CLEAN WATER ACT
  SOIL REMEDIATION IS AIMED AT SOURCE CONTROL, AND IMPLEMENTATION OF THE RECOMMENDED ALTERNATIVE WOULD RESULT IN AN END TO POTENTIAL CONTAMINATION OF SURFACE WATER.

- UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE (MEP).

NO ALTERNATIVES WERE DEVELOPED FOR OPERABLE UNIT TWO AT THIS SITE AS THE ENDANGERMENT ASSESSMENT SHOWED THERE WAS NO RISK TO HUMAN HEALTH OR THE ENVIRONMENT FROM GROUNDWATER. ADDITIONALLY, ALL EXCEPT ONE WELL HAD METALS (INORGANICS) AT CONCENTRATIONS LESS THAN ANY ARAR. THE ONE WELL CONTAINED CHROMIUM AT .008 PPM OVER THE FEDERAL DRINKING WATER STANDARD OF .05 PPM. THIS AMOUNT IS WITHIN THE ANALYTICAL VARIANCE OF 20% FOR CLP LABS AND IS THEREFORE NOT CONSIDERED ADEQUATE TO JUSTIFY AN EXPENSIVE TREATMENT AT THE SITE.

THIS REMEDY IS PROTECTIVE, EFFECTIVE, ATTAINS ARARS AND IS THE MOST COST EFFECTIVE SOLUTION FOR THE SITE.

FOR THE ABOVE REASONS, TREATMENT OF GROUNDWATER AT THIS SITE IS IMPRACTICABLE.

- PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT
  THE PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT WAS NOT SATISFIED, DUE TO THE "NO ACTION" ALTERNATIVE HAVING BEEN DETERMINED TO BE THE BEST SOLUTION FOR THE SITE.

OPERATION AND MAINTENANCE

NO LONG-TERM OPERATION AND MAINTENANCE REQUIREMENTS ARE EXPECTED FOR THIS ALTERNATIVE. THE OPERABLE UNIT ONE ROD MENTIONS LONG-TERM MONITORING AS A POSSIBILITY DUE TO THE LACK OF DATA ON THE STATUS OF GROUNDWATER.

#TA

TABLE 3-1
CLP GROUND WATER RESULTS
INDEPENDENT NAIL COMPANY SITE
BEAUFORT, SOUTH CAROLINA
REM II

WELL NO.	CN	SB	AS	BE	CD	CR	CU
MW-15	U*	U	.032JN	U	U	.058	.011
M	U*	U	U	U	U	.005	U
D	U*	U	.006JN	U	U	.005	U
MW-25	.02J*	U	U	U	U	U	U
M	U*	U	U	U	U	U	U
D	U*	U	.005JN	U	U	U	U
MW-035	.02	U	U	U	U	U	U
M	U	U	U	U	U	U	U
D	U	U	U	U	U	U	U
MW-45	U*	U	U	U	U	.007	U
M	U*	U	U	U	U	U	U
D	U*	U	U	U	U	U	U
MW-55	U*	U	U	U	U	U	U
M	U*	U	U	U	U	U	U
D	U*	U	U	U	U	U	U
F	U*	U	U	U	U	U	U
MW-65	U	U	U	U	U	U	U
M	U	U	U	U	U	U	U
D	.11	U	U	U	U	U	U
F	U*	U	U	U	U	U	U
MW-75	U*	U	.012JN	U	U	U	U
M	U*	U	U	U	U	U	U
D	U*	U	U	U	U	.007	U
MW-85	U*	U	U	U	U	.008	U
M	.03J*	U	U	U	.005	.005	U
D	U*	U	.010	U	U	U	U
F	U*	U	U	U	U	U	U

DETECTION LIMIT	0.01	0.031	0.010	0.003	0.005	0.006	0.009

ALL CONCENTRATIONS ARE MG/L
U = UNDETECTED
J = ESTIMATED VALUE
N = PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
R = QC INDICATES THAT DATA IS UNSABLE
* = EXCEEDED LABORATORY HOLDING TIME

TABLE 3-1 (CONTINUED)

CLP GROUND WATER RESULTS
INDEPENDENT NAIL COMPANY SITE
BEAUFORT, SOUTH CAROLINA
REM II

WELL NO.	PB	HG	NI	SE	AG	TI	ZN
MW-15	U	U	.018	U	U	U	U
M	.001J	U	U	U	U	U	U
D	U	U	U	U	U	U	U
MW-25	U	U	U	U	U	U	U
M	U	U	U	U	U	U	U
D	U	U	U	U	U	U	U
MW-035	.004J	.003JN	U	U	U	U	.057
M	.005J	.0014JN	U	U	U	U	.098
D	.0047	.003JN	U	U	U	U	.054
MW-45	U	U	U	UR	U	U	U
M	U	U	U	UR	U	U	U
D	U	U	U	UR	U	U	U
MW-55	U	U	U	UR	U	U	U
M	U	.00026JN	U	UR	U	U	U
D	U	U	U	UR	U	U	U
F	U	U	U	U	U	U	.051
MW-65	U	.0034JN	U	U	U	U	.048
M	U	.0002JN	U	U	U	U	.061
D	U	.00022JN	U	U	U	U	.058
F	U	U	U	UR	U	U	U
MW-75	U	U	U	UR	U	U	U
M	U	U	U	UR	U	U	U
D	U	U	U	UR	U	U	U
MW-85	.002	U	.007	U	U	U	.037
M	U	U	U	U	U	U	.075
D	U	U	U	U	U	U	.043
F	.002	U	U	U	U	U	.042
DETECTION LIMIT	0.007	0.0002	0.011	0.005	0.005	0.010	0.070

ALL CONCENTRATIONS ARE MG/L
U = UNDETECTED
J = ESTIMATED VALUE
N = PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
R = QC INDICATES THAT DATA IS UNSABLE
* = EXCEEDED LABORATORY HOLDING TIME

TABLE 4-1

COMPARISON OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER TO DRINKING WATER STANDARDS AND CRITERIA

CONTAMINANT	HIGHEST CONCENTRATION DETECTED IN GROUNDWATER (MG/LITER)	PRIMARY MCL (MG/LITER)	SECONDARY MCL (MG/LITER
CHROMIUM VI	0.58	0.05 (TOTAL CR) (A)	----
CYANIDE	0.110	----	----
ZINC	0.098	----	5 (B)

(A) EPA 1985E
(B) EPA 1986E
(C) EPA 1987E

TABLE 4-1 (CONTINUED)

COMPARISON OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER TO DRINKING WATER STANDARDS AND CRITERIA

	HEALTH ADVISORY (C)				
	1-DAY	10-DAY	LONGER-TERM		LIFEFIME
			10KG CHILD (MG/KG/DAY)	70KG ADULT (MG/KG/DAY)	
CHROMIUM VI	1.4	1.4	0.24	0.84	0.12
CYANIDE	0.22	0.22	0.22	0.77	0.154
ZINC	----	----	----	----	----

(A) EPA 1985E
(B) EPA 1986E
(C) EPA 1987E

TABLE 4-2

SUMMARY OF HAZARD INDICES FOR EACH EXPOSURE PATHWAY

EXPOSURE PATHWAY/CONTAMINANT	CHRONIC DAILY INTAKE (CDI) OVER 74 YEARS (MG/KG/DAY)	ORAL REFERENCE DOSE (RFD) (MG/KG/DAY)	CDI:RFD
INGESTION OF CONTAMINATED GROUND WATER:			
CHROMIUM VI	1.8XLO-3	5X10-3C	3.6XLO-1
CYANIDE	3.5XLO-3	2X10-2C	1.75XLO-1
ZINC	3.LXLO-3	2.1X10-1D	1.48XLO-2
HAZARD INDEX	---	---	5.5XLO 1(1)
INGESTION OF CONTAMINATED MILK:B			
CHROMIUM VI	1.2XLO-6	5X10-3C	2X10-4
ZINC	2XLO-3	2.LXL0-1D	9.5XLO-3
HAZARD INDEX	---	---	9.7XLO-3(1)
INGESTION OF CONTAMINATED BEEF:B			
CHROMIUM VI	LXLO-4	5XLO-3C	2X10-2
ZINC	2.7XLO-3	2.LXLO-LD	1.3XL0-2
HAZARD INDEX	---	---	3.3XLO-2(1)
TOTAL HAZARD INDEX FOR ALL 3 PATHWAYS (SUM OF INDIVIDUAL HAZARD INDICES)		6X10-1(1)	

A ALL HAZARD INDICES ARE LESS THAN ONE (1) INDICATING LOW POTENTIAL FOR ADVERSE NONCARCINOGENIC HEALTH EFFECTS.
B CYANIDE WAS NOT INCLUDED IN THIS ANALYSIS BECAUSE IT DOES NOT BIOACCUMULATE (EPA 1987A).
C EPA 1988A.
D EPA 1984E.

#RS

ATTACHMENT 1

RESPONSIVENESS SUMMARY

1. OVERVIEW

A PRESS RELEASE ANNOUNCING THE OPPORTUNITY FOR A PUBLIC MEETING WAS ISSUED ON JUNE 29, 1988. PUBLIC NOTICES ANNOUNCING THE OPPORTUNITY FOR A PUBLIC MEETING AND THE OPENING OF THE PUBLIC COMMENT PERIOD APPEARED IN THE JUNE 30 ISSUE OF THE BEAUFORT GAZETTE, THE MOST WIDELY READ NEWSPAPER IN THE AREA OF THE INDEPENDENT NAIL COMPANY SITE. NO REQUESTS FOR THE MEETING OR COMMENTS ON THE OPERABLE UNIT TWO REMEDIAL INVESTIGATION REPORT WERE RECEIVED.

2. COMMUNITY PROFILE AND HISTORY OF COMMUNITY INVOLVEMENT

THE CITY OF BEAUFORT IS LOCATED ON THE SOUTHEAST SIDE OF BEAUFORT COUNTY. IT IS FORTY-FIVE MILES NORTHEAST OF SAVANNAH, GEORGIA, AND THIRTY MILES NORTH-NORTHEAST OF HILTON HEAD, SOUTH CAROLINA. BEAUFORT COUNTY CONSISTS LARGELY OF A COLLECTION OF SIXTY-EIGHT ISLANDS, DEFINED BY A COMPLEX NETWORK OF WATERWAYS. THE COUNTY IS AN EXTREMELY SENSITIVE ENVIRONMENTAL AREA -- ACCORDING TO ONE LOCAL OFFICIAL, IT IS ONE OF THE LAST "PRISTINE" ENVIRONMENTS ON THE EAST COAST.

TOURISM, RECREATION, AND FISHING ARE MAJOR LOCAL INDUSTRIES, WITH SEVERAL RESORTS IN THE COUNTY (INCLUDING HILTON HEAD) NOTED FOR THEIR BOATING AND GOLF. THERE ARE NUMEROUS RIVERS, CREEKS, AND PUBLIC AND PRIVATE BEACHES AND GOLF COURSES FOUND THROUGHOUT THE COUNTY. SEVERAL INTERNATIONAL GOLF AND TENNIS TOURNAMENTS ARE HELD AT HILTON HEAD EACH YEAR. THERE IS BOTH RECREATIONAL AND COMMERCIAL FISHING, AND LOCAL RESIDENTS ARE PROUD OF THE COUNTY'S REPUTATION FOR GOOD SEAFOOD.

THERE IS ALSO A LARGE MILITARY PRESENCE IN THE COUNTY, WITH APPROXIMATELY 15,000 MILITARY PERSONNEL LIVING THERE. IN ADDITION TO THE AIR STATION, THE MARINE CORPS HAS A LARGE TRAINING CAMP AT PARRIS ISLAND, WHICH IS IMMEDIATELY SOUTH OF PORT ROYAL ISLAND. ACCORDING TO THE BEAUFORT COUNTY JOINT PLANNING COMMISSION (BCJPC), 22,000 RECRUITS ARE TRAINED AT PARRIS ISLAND EACH YEAR. THERE IS ALSO A LARGE NAVAL HOSPITAL IN BEAUFORT COUNTY.

WHILE THE COUNTY IS NOW CONSIDERED RELATIVELY RURAL, COMMERCIAL AND RESIDENTIAL DEVELOPMENT IS OCCURRING RAPIDLY. ACCORDING TO BCJPC, THE COUNTY'S POPULATION HAS GROWN 28% SINCE 1980 -- GROWTH IN THE CITY OF BEAUFORT HAS BEEN LOWER THAN 28%, WHILE THAT IN THE RESORT AREAS SUCH AS HILTON HEAD HAS BEEN MUCH HIGHER.

BOTH THE CITY AND COUNTY GOVERNMENTS ARE LOCATED IN THE CITY OF BEAUFORT. THE CITY IS GOVERNED BY A MAYOR AND A FIVE-MEMBER CITY COUNCIL, ALL OF WHOM SERVE FOUR-YEAR TERMS. THERE IS ALSO A CITY MANAGER WHO IS RESPONSIBLE FOR MOST OF THE DAY-TO-DAY TASKS OF RUNNING THE CITY. THE COUNTY IS RUN BY A COUNTY ADMINISTRATOR AND A NINE-MEMBER COUNTY COUNCIL. THESE COUNCIL MEMBERS SERVE TWO YEAR TERMS; FOUR ARE SELECTED AT LARGE, FIVE BY DISTRICT. THE COUNTY COUNCIL HAS A ONE-MEMBER COASTAL COUNCIL BOARD/COMMISSION THAT OVERSEES ENVIRONMENTAL MATTERS.

THE PRINCIPAL STATE AGENCY INVOLVED WITH THE SITE IS THE SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (SCDHEC). SCDHEC HAS A BROAD ARRAY OF RESPONSIBILITIES, INCLUDING CONDUCTING RESTAURANT INSPECTIONS, MONITORING WATER QUALITY, AND HANDLING SOLID AND HAZARDOUS WASTE ISSUES. ONE ELECTED OFFICIAL SAID THAT ANY RESIDENT COMPLAINTS ABOUT ENVIRONMENTAL MATTERS CONCERNING THE SITE WOULD BE REFERRED TO SCDHEC.

COUNTY RESIDENTS, HOWEVER, HAVE EXPRESSED VIRTUALLY NO INTEREST IN THIS SITE -- NO COMPLAINTS

HAVE BEEN RECEIVED BY LOCAL OFFICIALS. THERE HAS ALSO BEEN VERY LITTLE PUBLICITY ABOUT THE SITE -- THE ONLY NEWSPAPER ARTICLES ON THE SITE APPEARED WHEN THE SITE WAS LISTED ON THE NPL. HOWEVER, OFFICIALS NOTED THAT THIS SEEMING LACK OF SPECIFIC CONCERN COULD CHANGE RAPIDLY IF THERE IS SUFFICIENT ADVERSE PUBLICITY ON THE SITE. THE SOURCE OF THIS POTENTIAL, ACCORDING TO LOCAL OFFICIALS, IS THAT THE CITIZENS ARE VERY INTERESTED IN ENVIRONMENTAL ISSUES IN GENERAL. THE COUNTY S RAPID RATE OF DEVELOPMENT HAS HEIGHTENED THIS CONCERN. MANY PEOPLE LIVE IN THE AREA BECAUSE OF ITS NATURAL BEAUTY AND RECREATION OPPORTUNITIES, AND THEY DO NOT WANT THESE CHARACTERISTICS RUINED. FURTHERMORE, ONE OFFICIAL COMMENTED THAT MANY RESIDENTS, ESPECIALLY IN THE RESORT AREAS, ARE WELL-EDUCATED RETIREES WHO HAVE THE TIME, INCLINATION, AND EXPERTISE TO BECOME HEAVILY INVOLVED IN LOCAL ENVIRONMENTAL ISSUES. AS EVIDENCE OF THIS INTEREST, LOCAL OFFICIALS POINT TO HEAVY ATTENDANCE AT PUBLIC MEETINGS ON ISSUES SUCH AS LOCAL DEVELOPMENT PROJECTS AND A PROPOSAL TO BUILD A COUNTY INCINERATOR.

ACCORDING TO LOCAL OFFICIALS, MORE RESIDENTS ARE CONCERNED ABOUT THE WAMCHEM SITE THEN ABOUT THE INDEPENDENT NAIL SITE BECAUSE OF THE CONTAMINANTS INVOLVED AND WAMCHEM S PROXIMITY TO RESIDENTS. ONE RESIDENT CONTACTED DURING THE PREPARATION OF THIS PLAN WAS NOT AWARE OF THE INDEPENDENT NAIL SITE; BECAUSE OF HIS PROXIMITY TO THE WAMCHEM SITE AND NEARBY MCCALLEY CREEK, HOWEVER, HE WAS QUITE CONCERNED ABOUT THE CONTAMINANTS EMANATING FROM WAMCHEM. EVEN THOUGH THERE HAS BEEN LITTLE PUBLICITY OR OUTWARD EVIDENCE OF CITIZEN CONCERN ABOUT THE WAMCHEM SITE, THIS RESIDENT ESTIMATED THAT DOZENS OF RESIDENTS ARE DIRECTLY AFFECTED BY THE WAMCHEM SITE. HE THOUGHT RESIDENTS WOULD CONTACT THEIR COUNTY COUNCILMAN, STATE LEGISLATOR, OR SCOHEC IF THEY WANTED TO REGISTER THEIR CONCERNS. THIS RESIDENT ALSO IS INTERESTED IN ENVIRONMENTAL ISSUES IN GENERAL AND WOULD LIKE TO RECEIVE ANY INFORMATION EPA DISTRIBUTES ON THE INDEPENDENT NAIL SITE.

KEY COMMUNITY CONCERNS

THE PRIMARY CONCERN EXPRESSED BY EVERY INTERVIEW WAS THE POSSIBLE CONTAMINATION OF AREA GROUNDWATER. FURTHER INVESTIGATIONS IN THE COURSE OF PREPARING THE COMMUNITY RELATIONS PLAN, HOWEVER, REVEALED ADDITIONAL CONCERNS DEALING WITH THE LOCAL INDUSTRIAL BASE AND FINANCIAL RESPONSIBILITY FOR THE CLEANUP. THESE ADDITIONAL CONCERNS CURRENTLY DO NOT SEEM TO BE PRESSING. ACCORDING TO THE PEOPLE WHO EXPRESSED THEM, HOWEVER, THESE CONCERNS COULD FLARE UP QUICKLY IF ACTIVITIES AT THE SITE OR ADVERSE PUBLICITY ABOUT THE SITE S AFFECT ON THE LOCAL ENVIRONMENT WARRANT AN INCREASE IN COMMUNITY CONCERN.

DETAIL DESCRIPTIONS OF CONCERNS EXPRESSED BY LOCAL OFFICIALS DURING COMMUNITY INTERVIEWS ARE PRESENTED BELOW:

1. GROUNDWATER CONTAMINATION

   EVEN THOUGH THE HOMES AND BUSINESSES AROUND THE INDEPENDENT NAIL SITE ARE CONNECTED TO THE CITY WATER SUPPLY, LOCAL OFFICIALS STATED THAT SOME RESIDENTS THERE MAY USE PRIVATE WELLS. WHILE OFFICIALS HAVE YET TO RECEIVE A COMPLAINT CONCERNING THE QUALITY OF THE WATER FROM ANY PRIVATE WELL, THEY WANT TO BE SURE THAT THIS WATER IS NOT CONTAMINATED. FURTHERMORE, LOCAL OFFICIALS ARE CONCERNED THAT ANY GROUNDWATER CONTAMINATION PROBLEM COULD EXTEND FAR BEYOND THE IMMEDIATE SITE AREA. BECAUSE THE SITE RESTS OVER THE FLORIDAN AQUIFER, OFFICIALS WANT TO BE SURE THAT THIS SIGNIFICANT SOURCE OF DRINKING WATER IS NOT THREATENED

2. PRESERVATION OF THE NATURAL ENVIRONMENT

   ACCORDING TO LOCAL OFFICIALS, MANY OF THE RESIDENTS WHO LIVE IN THE AREA DO SO BECAUSE OF ITS NATURAL BEAUTY. NO RESIDENTS HAVE EXPRESSED CONCERN ABOUT THE EFFECT OF THE INDEPENDENT NAIL SITE ON THEIR ENVIRONMENT. THEY HAVE BEEN INVOLVED IN OTHER LOCAL ENVIRONMENTAL ISSUES, HOWEVER, AND OFFICIALS FEEL THIS GENERAL INTEREST COULD BECOME FOCUSED ON THIS SITE ONCE THE PUBLIC IS AWARE OF ITS EXISTENCE. FOR THIS REASON,

OFFICIALSFEEL THAT IN ORDER TO AVOID ANY UNNECESSARY CONCERN, IT IS ESPECIALLY IMPORTANT THAT ANY PUBLICITY ABOUT THE SITE BE AS ACCURATE AND OBJECTIVE AS POSSIBLE.

3. POSSIBLE FINANCIAL LIABILITY

ACCORDING TO SITE FILES, BEAUFORT COUNTY ONCE OWNED THE LAND NOW OCCUPIED BY THE SITE, AND LEASED IT TO BLAKE AND JOHNSON. EPA AT ONE TIME IDENTIFIED THE COUNTY AS A PRP BECAUSE OF THIS RELATIONSHIP. THE COUNTY, HOWEVER, HAS INSISTED THAT IT HAD NO CONNECTIONS WITH THE OPERATIONS AT THE SITE, AND THE COUNTY ADMINISTRATOR SAYS THAT THE COUNTY IS NO LONGER DESIGNATED A PRP. COUNTY OFFICIALS, HOWEVER, ARE STILL INTERESTED IN THE PRP SEARCH PROCESS AND ARE CONCERNED THAT THE APPROPRIATE PARTIES PAY FOR THE CLEANUP.

4. PRESERVATION OF BEAUFORT S ABILITY TO ATTRACT INDUSTRY

CURRENTLY, ONE OF THE MAJOR INDUSTRIES IN BEAUFORT COUNTY IS TOURISM; ACCORDING TO ONE LOCAL OFFICIAL, THERE IS ONLY ONE CHEMICAL COMPANY IN THE AREA. YET ONE BEAUFORT COUNTY COUNCILMAN SAID THAT THE COUNTY NEEDS BOTH TOURISM AND OTHER, HEAVIER INDUSTRIES. HE BELIEVES THAT INDUSTRIES OTHER THAN THOSE FOUND IN THE TOURIST TRADE CAN PROVIDE BEAUFORT COUNTY RESIDENTS WITH JOBS THAT HAVE HIGHER SALARIES AND MORE POTENTIAL FOR ADVANCEMENT IN ORDER TO ENCOURAGE A BUSINESS GROWTH AND DIVERSITY, THE COUNCILMAN DOES NOT WANT THE COUNTY TO GAIN A REPUTATION FOR HOSTILITY TO NON-TOURISM INDUSTRIES. THEREFORE, THE COUNCILMAN IS CONCERNED THAT PUBLICITY ABOUT CLEANING UP THE SITE AND FINDING PRPS TO PAY FOR THE CLEANUP MAY GIVE BEAUFORT A REPUTATION FOR BEING ANTI-INDUSTRY.

3. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES

AS NO COMMENTS, ORAL OR WRITTEN, WERE RECEIVED, THIS SECTION IS NOT APPLICABLE.

4. REMAINING CONCERNS

NO REMAINING CONCERNS HAVE BEEN IDENTIFIED.

COMMUNITY RELATIONS ACTIVITIES TO DATE ARE LISTED IN THE ROD.